



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,005	01/11/2002	Bernd Krause	WEB 0044 PA	7204
23368	7590	12/14/2004	EXAMINER	
DINSMORE & SHOHL LLP ONE DAYTON CENTRE, ONE SOUTH MAIN STREET SUITE 1300 DAYTON, OH 45402-2023			MENON, KRISHNAN S	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/914,005

Applicant(s)

KRAUSE ET AL. *KN*

Examiner

Krishnan S Menon

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims 16-34 are pending in the RCE

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 16-21, 24-26, 29 and 34 rejected under 35 U.S.C. 102(a/e) as being anticipated by Kabumoto et al (US 5,723,510).

Claim 16: Kabumoto teaches a method of making a polymeric membrane (see abstract) comprising providing a mix of polymers, a fluid that dissolves or swells the polymer in the range 0.05 to 4.5% (col 3 lines 50-57; col 4 lines 34-45 and 65-67), charging the polymer mix with a gas (col 3 lines 50-67), foaming the polymer mix at temperature above glass transition (240 C, which is above T_g of polyester - see examples) and cooling to stabilize (col 5 lines 19-27). Kabumoto does not explicitly teach the membrane as having open pore foam; however, open pore should be inherent, since the reference uses the same process as that of the applicant. Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed

the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986)

Claims 17-20: the fluid is infiltrated or added during manufacture (col 4 lines 34-67: added during manufacture could mean added during any step of the manufacturing process); and comprises an organic liquid.

Claim 21: gas charged below T_g, and after shaping; foaming by increasing temperature above T_g: col 3 line 50 – col 5 line 45, examples.

Claims 24-26: charging gas is CO₂, is saturated: col 3 line 58- col 4 line 10

Claim 29: polycarbonate: col 2 lines 8-14

Claim 34: Intended use: A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

2. Claims 16-34 rejected under 35 U.S.C. 102(a/e) as being anticipated by Klotzer et al (5,980,795).

Claim 16: Klotzer teaches a method of making a polymeric open pore membrane (col 3 lines 1-7) comprising providing a polymer (abstract), charging the polymer mix with a gas, foaming the polymer mix at temperature above glass transition, and cooling the polymer membrane after foaming (col 3 line 8 – col 4 line 41).

Re the limitation of the polymer '... containing a fluid that dissolves or swells the polymer from ... 0.05 to 4.5%...', Klotzer teaches that adding solvents is disadvantageous because they need to be subsequently removed and small amounts remain. Applicants have recognized this fact in their arguments submitted on 11/8/04, which stated: "*Klötzer clearly desires a product that contains no solvents or other additives. See, e.g., col. 2, lines 35-42 and col. 5, lines 2-6, where Klötzer states that it is an advantage of Klötzer's process that there is no need for such additional substances which would then require removal "in an expensive manner." Klötzer criticizes prior art processes that use solvents at col. 1, lines 60-67, continuing onto col. 2, lines 1-3. Thus, contrary to the Examiner's assertion, one skilled in the art would not be motivated to modify Klotzer's process to do what Klötzer expressly teaches not to do.*" [Italics added]. Also Klotzer col 2 lines 54-67 teaches the undesirability of adding foreign compounds in the mix. Thus, Klotzer teaches that addition of fluids that dissolve or swell the polymer is not necessary, which anticipates the claims. A reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference "teaches away" from the invention is inapplicable to an anticipation analysis. *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998)

Claims 17-20: these claims have limitations about the fluid (fluid infiltrated in to the polymer; added during polymer manufacture; comprises gas or liquid; and comprises an organic liquid), which are anticipated by the negative teaching of Klotzer as above.

Claims 23-25 and 31 add further limitations which Klotzer in view of Siggel teaches as follows: The gas is charged after heating above the glass transition temperature and then extruded to foam the polymer as in claim 23 (Klotzer col 3 lines 8-15). The gas is carbon dioxide as in claims 24 and 25 (col 3 lines 1-5). Hollow fiber membrane as in claim 31 (Klotzer abstract).

Claims 21, 22, 26, 29, 30, 32, 33 and 34 add further limitations, which Klotzer teaches, as follows: the polymer being charged with gas below the glass transition temperature and foamed above the glass transition temperature in claim 21 (col 4 lines 19-40), polymer charged after shaping gas at below the glass transition temperature in claim 22 (col 3 lines 51-57), and the polymer is saturated with gas in claim 26 (col 4 lines 29-31), claim 29 adds polymer material like polysulfone, cellulose etc (col 3 lines 64-67) and cellulose acetate (col 1 lines 39-41), hollow surface fiber membrane in claim 30, which is asymmetric in claim 32 and 33 (col 3 lines 50-63), and use as a filtration membrane as in claim 34 (col 4 lines 4-12; also intended use - *Ex parte Masham*).

Regarding claim 27, Siggel in view of Klotzer does not specifically state temperature between 100 and 200 C. However, Klotzer teaches temperature above glass transition temperature, and therefore is inherent because glass transition temperature of polysulfone is about 190C: ref: www.boedeker.com/udel_p.htm.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kabumoto et al (US 5,723,510).

Kabumoto teaches all the limitations of claim 16. Claim 22 adds the further limitations of the polymer mix being charged with gas at a temperature above T_g and then foamed by reducing pressure, which is not explicitly taught by Kabumoto.

However, this would be equivalent to the process as recited in applicant's claim 21 (see above for the rejection of claim 21). The specification (pages 3-4) defines them as equivalent. In this case, the prior art element:

(A) performs the identical function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in the specification. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000)

(B) is not excluded by any explicit definition provided in the specification for an equivalent. A person of ordinary skill in the art would have recognized the interchangeability of the element shown in the prior art for the corresponding element disclosed in the specification. *Caterpillar Inc. v. Deere & Co.*, 224 F.3d 1374, 56 USPQ2d 1305 (Fed. Cir. 2000); *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1316, 50 USPQ2d 1161, 1165 (Fed. Cir. 1999); *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus. Inc.*, 145 F.3d 1303, 1309, 46 USPQ2d 1752, 1757 (Fed. Cir. 1998);

Lockheed Aircraft Corp. v. United States , 193 USPQ 449, 461 (Ct. Cl. 1977); Data Line Corp. v. Micro Technologies, Inc., 813 F.2d 1196, 1 USPQ2d 2052 (Fed. Cir. 1987).

(C) is an equivalent of the claimed element. There are insubstantial differences between the prior art element and the corresponding element disclosed in the specification. IMS Technology, Inc. v. Haas Automation, Inc., 206 F.3d 1422, 1436, 54 USPQ2d 1129, 1138 (Fed. Cir. 2000); Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 117 S. Ct. 1040, 41 USPQ2d 1865, 1875 (1997); Valmont Industries, Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 25 USPQ2d 1451 (Fed. Cir. 1993). See also Caterpillar Inc. v. Deere & Co., 224 F.3d 1374, 56 USPQ2d 1305 (Fed. Cir. 2000) the prior art element is a structural equivalent of the corresponding element disclosed in the specification. In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). That is, the prior art element performs the function specified in the claim in substantially the same manner as the function is performed by the corresponding element described in the specification

2. Claims 16-27 and 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klotzer et al (5,980,795) in view of Siggel et al (US 4,380,594).

Klotzer teaches a method of making a polymeric open pore membrane (col 3 lines 1-7) comprising providing a polymer (abstract), charging the polymer mix with a gas, foaming the polymer mix at temperature above glass transition, and cooling the polymer membrane after foaming (col 3 line 8 – col 4 line 41) as in claim 16.

Klotzer does not teach a fluid that dissolves or gels in the polymer from 0.05 to 4.5%. Siggel teaches adding about 1% of silicone oil in the process of making foam filaments by melt extrusion of polymers (col 2 lines 4-23). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Siggel in the teaching of Klotzer to improve the process (spinning speeds, etc.), to have more homogeneous pores, and making porous hollow fibers using known spinning equipment used to make conventional non-porous filaments without substantial adjustment or modifications of spinning conditions as taught by Siggel (see col 1 lines 38-59).

Claims 17-20, 23-25 and 31 add further limitations which Klotzer in view of Siggel teaches as follows: The fluid is infiltrated in the polymer as in claim 17, and is added to the polymer during manufacture as in claim 18, fluid is a gas or a liquid as in claim 19 (Siggel abstract), organic liquid as in claim 20 (Siggel abstract). The gas is charged after heating above the glass transition temperature and then extruded to foam the polymer as in claim 23 (Klotzer col 3 lines 8-15). The gas is carbon dioxide as in claims 24 and 25 (col 3 lines 1-5). Hollow fiber membrane as in claim 31 (Klotzer abstract).

Claims 21, 22, 26, 27, 29, 30, 32, 33 and 34 add further limitations, which Klotzer teaches, as follows: the polymer being charged with gas below the glass transition temperature and foamed above the glass transition temperature in claim 21 (col 4 lines 19-40), polymer charged after shaping gas at below the glass transition temperature in claim 22 (col 3 lines 51-57), and the polymer is saturated with gas in claim 26 (col 4 lines 29-31), claim 29 adds polymer material like polysulfone, cellulose etc (col 3 lines 64-67) and cellulose acetate (col 1 lines 39-41), hollow surface fiber membrane in claim

Art Unit: 1723

30, which is asymmetric in claim 32 and 33 (col 3 lines 50-63), and use as a filtration membrane as in claim 34 (col 4 lines 4-12; also intended use - *Ex parte Masham*).

Regarding claim 27, Siggel in view of Klotzer does not specifically state temperature between 100 and 200 C. However, Klotzer teaches temperature above glass transition temperature. It would be obvious to one of ordinary skill in the art at the time of invention that the glass transition temperature would depend on the polymer or the polymer mix selected and could be between 100 and 200C depending on the polymer or polymer mix. [glass transition temperature of polysulfone at 190C: ref: www.boedeker.com/udel_p.htm].

3. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klotzer (795) in view of Siggel (594) as applied to claim 16 above, and further in view of Malon et al (US 5,013,767).

Klotzer in view of Siggel does not teach the solvents of the instant claim. Malon teaches 1-methyl 2-pyrrolidone, dichloroethane and other solvents for melt-extruded hollow fibers (col 14 lines 35-40, col 12 lines 34-36). It would be obvious to one of ordinary skill in the art at the time of invention to use the solvent for polysulfone as taught by Malon in the teaching of Klotzer in view of Siggel for making asymmetric gas separation membranes.

Response to Arguments

Applicant's arguments filed 2/23/04 have been fully considered but they are not persuasive.

Pages 5-8 of the applicants' arguments are about the Kabumoto reference and the rejection based on inherency. In response to the argument, "In order to establish inherency, the evidence (as opposed to supposition or presumption) it must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by one of ordinary skill.", applicants claim a method, the steps of which are taught by the ref. Therefore, if the applicants are able to get the open pore foam structure, so would the ref. While the applicants may be obtaining the open porosity by the method as disclosed in the specification, the examiner has to go by the broadest reasonable interpretation of the claims. The reference does not teach that it forms only closed pores. Therefore, the burden of proof rests with the applicant. [T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). With regard to the US patent 4,473,665 submitted by the applicant to support their argument that the Kabumoto ref forms closed foam structure, it may be noted that sufficient process differences exist between this ref and the Kabumoto ref for

one of ordinary skill in the art to conclude that based on the '665 patent, Kabumoto ref would produce **only** 'closed cell' foam. Such differences are, to mention a few, '665 ref teaches rapid cooling, preventing cell nucleation, no nucleating agents, etc. (see abstract, col 2 lines 30-40), whereas Kabumoto teaches using nucleating agents, flattening the sheet over heated rollers after foaming, and then cooling, which implies relatively slower cooling (col 5 lines 19-27, col 2 lines 15-21). The argument that the intended use of the reference does not require open porous structure is not a sufficient reason to prove that it is all closed porous structure. Applicants' reference to the phrase "fine cell" in these references does not mean or imply "closed cell", it only means small, or fine as opposed to 'coarse' cells.

In response to the argument that "the polyesters of Kabumoto as impregnated by an organic solvent are not believed to be dissolved in these solvents": the claims do not recite that they have to be dissolved.

In response to the argument claim 22, issues of equivalency *in an infringement context* : the examiner does not believe that the principles would change just because it is in an infringement context, the principles are equally applicable in the patentability context as well, which is also recognized by their being quoted in the MPEP.

In response to the arguments about the Klotzer ref, and its negative teaching, please see the rejection. Also, Klotzer ref teaches the method wherein the use of solvents or other additives could be avoided, which would be useful especially in such cases as in human or veterinary medicine, etc., (col 4 lines 5-12). This does not mean that the process would not work if the solvents or additives are used. One of ordinary

skill in the art would find it advantageous to use solvents or additives to the Klotzer process in situations wherein, for example, making porous hollow fibers using known spinning equipment used to make conventional non-porous filaments without substantial adjustment or modifications of spinning conditions, as taught by Siggel (col 1 lines 53-59).

In response to applicant's argument that silicone oil do not dissolve or swell polymers, especially, polyethylene terephthalate (PET) and polyamide, please see Siggel col 7 lines 19-30, wherein the polymer melt is described as "homogenized mix" and "dissolved in", and the melt in question pertains to the cited polymers (see examples), which constitute factual evidence from the reference. The intended purpose of adding the silicone oil in the reference in col 4 lines 53-57 also indicate as a *plasticizer*, and plasticizers are known to swell the polymers, if not dissolve. The ref does teach 'homogenizing', which means making the mix of molten polymer and the silicone oil into one phase. If the two liquids are not miscible (or soluble in one-another), they would be inhomogeneous. If the applicant believes that this reference is in error, applicant is encouraged to provide factual evidence to that fact. Also please note that it is not necessary to copy exactly everything the references teach to establish a prima facie case of obviousness. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d

Art Unit: 1723

413, 208 USPQ 871 (CCPA 1981). In the case of a hollow fiber forming polymer other than what Siggel ref teaches, one may use a different solvent as taught by the Malon ref. In response to the applicant's argument that silicone oil has a different intended use in the Siggel ref: The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art also cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion


This action is made non-final because of the newly added grounds for rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan Menon
Patent Examiner


W. L. WALKER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700